



Dr George Brason: 'Entitled to speak my mind'

Protests by overseas students 'monstrous'

by John O'Leary

In a strong attack on the opponents of government policy on fee levels, a polytechnic director said this week that overseas students are abusing their privileges and depriving home students of their right to education by taking militant action.

Dr George Brason, Director of North East London Polytechnic, surprised delegates at a conference of "Aid Without Imperialism" in London with a speech defending the policies of successive governments on overseas students. Foreign students make an enormous contribution to higher education, he said, but there could be no sacred cows at this time.

"I believe that the politicians have reflected the instincts of the people, indeed it is their duty to do so," Dr Brason said. "Why can't we trust what the people think?" Unbiased observers had to accept that public opinion might be right.

Dr Brason pointed out that restrictions on overseas students had been applied by both Tory and Labour governments, while most pressure groups opposing the fees

could be accused of self-interest. They made "nice, wistful, liberal noises" without declaring their own hands.

The National Union of Students was dug out for particular criticism for using its overseas members as "election fodder" and becoming their own worst enemies. There would be no solution to the problem through disruptive tactics, which could eventually close down institutions and do no good for overseas or home students.

"There is growing resentment that overseas students, who are, after all, guests in this country, are grossly abusing their privileges. By occupying and closure of premises they are depriving indigenous students, especially part-time students, of their right to study," Dr Brason said.

"In plain language, I think it's monstrous. How dare overseas students resort to this activity? What right have they to say what people in this country should or should not do?"

Dr Brason said he felt entitled to speak his mind because his record both at NELP and in his previous position at Enfield College demonstrated that he was sympathetic to the problems of overseas students.

Students will fight to stop end of London validations

Students this week promised to fight to overturn the decision by London University to cease validating courses at its last remaining associated colleges.

The expected decision came at last week's meeting of the university Senate and, despite a resolution from the council of the Institute of Education expressing "profound regret" at the recommendation, there was no dissent. Students, who could have been expected to oppose the move, are not yet represented on the Senate.

Six colleges are associated with the institute but one, Shorepath College, Egham, is to merge with Brunel University next year. Goldsmiths College has applied to become a school of the university, and both the West London and Chelsea Institutes have opened discussions with the Council for National Academic Awards to transfer validation of their courses.

The remaining two, St Mary's College, Strawberry Hill, and the Richmond College, have yet to announce alternative plans for validation. They will have to do so, since London University has set October 1983 as the date for final effect to its courses. The last validation will take place in the summer of 1983.

A statement issued by the council of the Association of Institutions noted the decision to cease validation

with regret, and said that this year's high standards could be attributed partly to the institution's association with the university.

The university said that the possibility of devising a simpler degree structure to take account of criticisms made by a committee looking into the colleges had been explored but it became apparent that such a structure would restrict the freedom of the colleges to initiate and develop their own courses and degree programmes. A second committee, under Lord Annan, the vice-chancellor, had noted that college students' registration fees did not cover the costs to the university.

Students in the colleges are to hold a conference next month to which the new Senate will be invited when they will vote on a campaign to reverse the decision. Miss Roz Roubin, convener of the London Students' Organisation, said she feared that courses, and even whole colleges, could close as a result of the decision in which case militant action would be inevitable.

As a minimum demand the students want a commitment from the university that teacher education courses will be saved and that all possible help will be given to the colleges to find alternative validation of the university's education in its decision to withdraw.

Outlook for new telescope is black

by Robin McKie
Science Correspondent

An urgent investigation is being carried out by a special committee of the Science Research Council to find ways of slashing the costs of the proposed £16m second telescope for the Northern Hemisphere Observatory in Las Palmas, in the Canaries.

The news follows the recent Government cuts in the SRC's budget—far unless economies of at least £6m are made in the telescope construction, two of the council's other major astronomy projects will be jeopardized. In particular, there will be no new telescopes to observe millimetre radiation and the chances of developing a new healthy space programme will also be reduced.

At present, there is no chance of the 4.2m telescope being given the go-ahead by the SRC, although detailed proposals and castings had been made. Many British scientists believe that the instrument would have been the most important telescope of its kind in the world, because of its size, site and precise construction.

The new telescopes would have been completed by the mid-1980s, and would have formed an observatory complex with the Isaac Newton telescope now being shipped to Las Palmas from its former site in Herstmonceux.

An ad hoc committee of the SRC's astronomy, space and radio board has been set up, and various working parties are investigating different ways to reduce costs. In particular, they are investigating construction costs.

This may be done by stripping the telescope housing of all subsidiary facilities—such as staff rooms, photographic units and dark rooms—but not of any important scientific instrumentation. Astronomers using the new telescope would then have to share such facilities with scientists using the Isaac Newton telescope at the site.

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The report does not identify individuals nor deal with disciplinary action, which will eventually be a matter for the council.

It has already sparked a storm of protest from the polytechnic, which officially is unable to comment until it has seen the report.

The academic board has also called on Mr Carlisle to set up a public inquiry into the relationship between the polytechnic and the local authority.

The joint council representing non-teaching staff has also aligned itself with the academic board's stance.

The polytechnic's governors were also meeting late this week, and all unions have asked to see the director of academic support services, Mr Peter Fielden.

"We have every confidence in the institution and the absolute dedication and loyalty of its staff," Mr Fielden said. "The institution has an excellent academic record."

Mr Fielden added: "The academic staff are doing a first-class job, together with the non-academic support staff."

But Mr Mark Carlisle, the Education Secretary, has made clear that he does not think the council should continue after October 1983.

In a letter to Dr Richard Hogg, chairman of the council, Mr Carlisle said that the work had only just begun to make an impact on its two main tasks—a review of current practice and the means of most effectively deploying existing resources and identifying new ones.

'I' level examination plan will equal half an 'A' level

by Patricia Santinelli

Firm proposals for the introduction of a new intermediate level examination, halfway between O and A levels, are to be sent to the Education Secretary by the Schools Council in the New Year. The Council has also decided to put forward a plan for improving the A level system.

Mr Mark Carlisle wrote to the Schools Council in July asking for comments on the best way forward with 16-plus examinations. He also announced his decision not to replace A levels with the controversial N and F level examinations after overwhelming opposition from the higher education sector—in particular the universities.

Now a document, prepared by Schools Council working party and given final approval by its finance and priorities committees last week, outlines two groups of young people for whom the introduction of new courses and examinations is imperative.

'Salami slicing' attack on cuts in quality

The vice-chancellor of Leicester University said this week that a smaller number of universities with the highest standards would be better than "the salami slicing" which we seem to be drifting towards.

Mr Maurice Shock said in his annual report to Court: "Damage to the system could be irreparable if the Government subjects universities to cuts in expenditure which will result in their all being subject to salami slicing of the worst kind."

"More or less, innovation out of the question. The result will be that all universities will be enfeebled with shrunken staffs, depleted staff numbers and impoverished resources."

He said that if the country could not afford to maintain the present system then choices would have to be made and quality must not be sacrificed. Better to have fewer universities with the highest standards and a realistic reserve of quality.

Level funding was "a euphemism for downhill all the way". The fact that Leicester could expect for 1983-84 would mean a reduction of about 20 per cent in the present level of activities. The outcome would be a shoddy Leicester University as we know it.

The London Institute of Education is to discontinue 11 temporary academic posts this year, and a further 15 permanent posts may have to be phased out by 1983-84 because of the cuts.

There are also plans for a 30 per cent expenditure cut on non-salary items, which will effect standards of maintenance, decoration and departmental support.

Six-year lifespan for ACACE

The life of the Advisory Council for Adult and Continuing Education has been extended for a further three years.

But Mr Mark Carlisle, the Education Secretary, has made clear that he does not think the council should continue after October 1983.

In a letter to Dr Richard Hogg, chairman of the council, Mr Carlisle said that the work had only just begun to make an impact on its two main tasks—a review of current practice and the means of most effectively deploying existing resources and identifying new ones.

But he expected that the council would be able to complete these tasks within the six-year lifespan offered by the extension.

The first are young people who achieve middling CSE but want to pursue their education for another year. New courses and qualifications are needed for them as the described last week in the Keble report.

The second target group is similar to that already existing for A and A levels. It is suggested that the sixth-form curricula should be broadened, and this could be done with the introduction of as few as two roughly equivalent to half an A level.

This would enable students to gain an additional qualification, for example a mathematics or science certificate, could continue to study for A levels but at a lower level than A level.

Suggested improvements to the level system include some of the Standing Conference on University Entrance—such as a reduction in the number and variety of subjects, the simplification of syllabuses, the identification of "core" or "content" and within subjects.

AUT claim

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professor (average) from £12,000 to £14,919.

Public sector lecturers are to leave to wait until the end of February before they receive a salary which may emerge from Burnham machinery from June 1.

The Burnham committee is due to meet until the second week of the new year to decide on a per cent interim deal.

Despite the delays in the Clegg commission's pay comparability exercise, unions and management are expecting at least an indication of what it may recommend when the three parties meet today.

The terms of the deal would be agreed by the end of January. The terms of the deal would be agreed by the end of January.

Taking the initial 9 per cent increase, this would bring lecturers' salaries to £14,919. The delay caused by the move to postgraduate training and increase the proportion of SSRC funds allocated to major research ventures, such as the proposed Centre for the Analysis of Technological Change.

In the past year the council has received a conspicuously less favourable treatment than the other research councils. In June it had to cut its budget by £1.5m, and was forced to tell more than 400 postgraduate students that their awards had been withdrawn.

Education lobby for Parliament

Parliament's official new education lobby held its inaugural meeting at the House of Commons this week.

The group, which spans both Labour and Conservative MPs, consists mostly of Labour backbenchers and is headed by Harry Greenway, MP for Belling North.

The formation of the lobby follows a meeting of MPs with the Secretary of State for Education, Mr David Howell, on the subject of the lobby's formation.

The group of MPs will be closely linked with the Whips' office and the Education Secretary.

NEXT WEEK

Sutton Hoo and British Academy

J. R. Rayetz on Radical Science

Campus terror in Italy

Interview with Lord Annan

Anthony Mann on the AUT council report

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Social scientists face big cuts in postgraduate training



by Peter David

A big cut in postgraduate training, with managament studies being protected at the expense of traditional social science subjects, is being planned by the Social Science Research Council following a major review of its budget priorities.

The new policy is part of an overall strategy by Sir Michael Foster, who became chairman of the council last year, to reduce its commitment to postgraduate training and increase the proportion of SSRC funds allocated to major research ventures, such as the proposed Centre for the Analysis of Technological Change.

In the past year the council has received a conspicuously less favourable treatment than the other research councils. In June it had to cut its budget by £1.5m, and was forced to tell more than 400 postgraduate students that their awards had been withdrawn.

Safeguards demanded for London

by Nigel Crieger

Academic staff of London University have pressed for an urgent meeting with senior officials to discuss the institution's financial position. Meanwhile the Government has been asked what it will do to safeguard the future of three schools of the university threatened with closure.

The Association of University Teachers has written the university to ask for a full financial statement to be made available to the staff.

Council considers Huddersfield Poly request to open books

by David Jobbins

Governors of Huddersfield Polytechnic and Kirklees Council were this week apparently heading for a major confrontation over allegations of misadministration of financial and other affairs.

The council's finance sub-committee is to meet today under certain circumstances a demand from the governors to lift the veil of secrecy surrounding the auditors' report on the polytechnic's accounts. The report also led to a threat of disciplinary action and eventually a takeover of the polytechnic by day running by council officials.

It is highly likely that a committee, elected by the governors at a special pre-Christmas meeting, will refuse to talk with representatives of the authority unless Kirklees agrees to put on the table a meeting to discuss the allegations. The committee was not elected to deal with the authority but to review the report and other relevant information, none of which has yet been seen by the public. The report also led to a threat of disciplinary action and eventually a takeover of the polytechnic by day running by council officials.

The science vote for 1980-81 contained another 2 per cent cut, and the SSRC intends to protect these areas from reductions in postgraduate awards. But several traditional subjects—economics and social history, political science, social anthropology and psychology—will face big reductions in the number of awards.

A second major change in the postgraduate training policy has also been agreed by the council's board. Resources are likely to be concentrated in large departments with "visible programmes of training", and some departments which used to receive a small amount of SSRC awards will be discontinued.

The policy changes will begin to bite in October, when the next triennial review of all departments receiving SSRC awards is due to take place. But in the interim, competition for awards is bound to become fiercer in a constricted market.

Prince Charles tipped to lead engineers

by Robin McKie

Britain's engineers could soon find themselves with a Royal leader—for Prince Charles is now being put forward as a prime candidate for chairman of the executive of the proposed Engineering Authority.

Prince Charles is a personal choice of Sir Monty Finniston, whose committee has recommended the setting up of the authority as the principal means of reinvigorating UK manufacturing industry. However, the view is widely shared by other members of the committee who generally favour an industrialist for the chairmanship.

Sir Monty's arguments rely on Prince Charles' status which he believes would be vital in attracting many engineers to accept the authority and to agree to its proposed registration regulations. Given that Prince Charles may wait many years before being crowned, his job would be a valuable interim role for he would be directing the revitalization of industry by encouraging the introduction of new technology and engineering talent. This would require the support of young engineers and Prince Charles could be seen as an acceptable figure to them.

But many others argue against the Prince's lack of experience in dealing with complex, delicate negotiations at a high level. This will be particularly vital in the case of the proposed £10m-a-year authority as it will have to take over the work of existing bodies. Its functions will include the setting up of a registration system for engineers, similar to the one which now exists for doctors; the establishment of an accreditation procedure for engineering courses; the monitoring of industrial training courses; and the general control of standards.

But the authority will still have to cooperate with many of the bodies stripped of their powers. In nearly all respects the authority will have to achieve its goals by working through other agencies and representatives from these, too, should be fully involved in working sub-committees, the committee report states.

It is envisaged, as well as industry based representation, the major engineering institutions, the industrial training boards and various educational bodies should continue to play major roles.

To set up such a system will require industrial experience and a detailed knowledge of engineering education—which many feel would exclude Prince Charles. The 15 to 20 member executive is to be made up mostly of engineers.

But on Wednesday the Finniston committee will be officially disbanded once it has presented its report or a public meeting in London. It will then be the personal influence of the individual members which will count over the selection of a chairman.

Responsible scientists

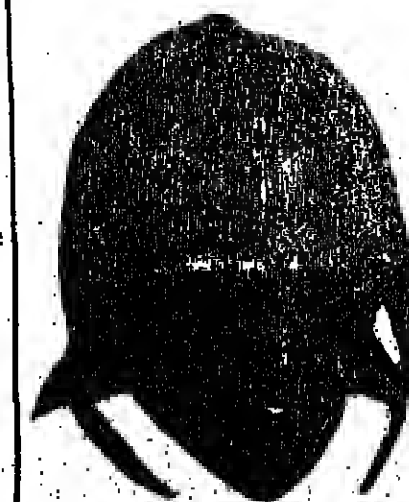
J. R. Rayetz examines the British Society for Social Responsibility in Science in the third of a series on pressure groups, 8

While councilors may have expected a request for a meeting as an early priority in view of the gravity of the situation, it is clear that the special committee is not disposed to talk at least until the report is released to it.

One request from the authority to the special governing committee for a meeting has already been rejected. There is no indication from Kirklees as to whether it will agree to hand the report over to the governors' committee. The Conservative leader of the council, Councillor Tim Cliffe, declined to comment, generally and refused to say if the closure would have to be decided

by the full council, a committee or senior councillors. It is clear that the authority has been taken back by the union front presented by polytechnic governors, academic board, and academic and support staff in condemning its actions. The expectation seemed to be that the authority would make progress to enable Kirklees to withdraw its demand of seeking the consent of Sir Mark Carlisle, Secretary of State for Education, to a takeover of the polytechnic. But the "high" bid of being turned down by the authority means that the "Kirklees" bluff may have in effect been called.

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DES reveals huge decline in training

by David Johnnie

The massive decline in the numbers of school leavers going on to initial teacher training is disclosed in the latest figures from the Department of Education.

From 34 per cent of school leavers in 1967-68, about half the percentage embarking on degree courses that year, it had fallen to 0.5 per cent by 1977-78.

Of the 734,000 school leavers in 1977-78, 350,000 went on to a teacher training course, compared with 52,000 in 1967-68. Only 0.2 per cent of boys chose teacher training, compared with 0.9 per cent of girls.

The statistics are bound to reinforce anxieties over the supply of teachers to meet the demands of this middle and late 1980s.

Most (69 per cent) of the 62,500 school leavers with three or more A levels entered degree courses, with about one third of that number taking further education courses and the remainder seeking jobs.

Of the 28,700 school leavers with two A levels, 30 per cent chose a degree course while 40 per cent sought employment. Fewer than 10 per cent of the 112,000 with one or more A level decided to seek a job straight from school.

The figures show a tendency to mix science A levels with subjects in the arts and social sciences. In 1967-68 35 per cent of school leavers with two or more A levels passed in

Ngaio Crequer reports on the universities' response to spending cuts Lancaster's do-it-yourself solution

Scientists will have to make their own equipment and staff will have to do their own typing to save costs, Professor Philip Reynolds, acting vice-chancellor of Lancaster University has warned.

He told the Council at its annual meeting that Lancaster would need to lose an estimated 13 or 14 staff a year up to 1983-84. There could be no replacements of resigning staff for four years. There was already a total freeze on vacancies and one department was without a professor.

"Student numbers would have to be restricted in those departments where staff leave and these might well be the departments where student quality is at its highest", he said. "The quality of the university would thus be savagely undermined."

Professor Reynolds said that the university's deficit this year could reach £350,000, which would wipe out the revenue balances. With the new level of funding, a deficiency of about £300,000 or more would be repeated each year at the present level of operation.

The withdrawal of funding for overseas students meant that Lancaster would expect to lose by 1983-84 £1.05 million at constant prices, or just over 11 per cent of the university's income.

Fees would offset this loss but no analysis had shown that Lancaster could lose between 30 and 40 per cent of present overseas numbers. The financial loss this would cause, plus the funding deficiency would mean that economies of between £640,000 and £800,000 would be required by 1983-84.

One effect of the new policy would be that universities would be scouring the highways and byways of the country for the world to attract children of the rich

Statistics 'favour universities'

by John O'Leary

The public sector of higher education is better equipped to cope with the cuts than the private sector, according to Mr David Bethel, chairman of the Committee of Directors of Polytechnics.

In a recent study of several anomalies arising from the binary system, Mr Bethel warns that they will have to be taken into account in any attempt to assess standards in universities and polytechnics.

One such anomaly was the different method of calculating full-time equivalent students (FTEs). Whereas in a university all part-time students were counted as 0.5 of a full-time student, in polytechnics and colleges a student attending for one evening a week counted as 0.15 on average, and a student in class for one whole day and one evening counted as 0.35.

This represents a positive disincentive for staff to develop part-time courses and the resulting FTE statistics are used as an indicator of performance, Mr Bethel said.

His own Institution, Leicester Polytechnic, had found it almost impossible to gain credit for a distance learning scheme to update graduate pharmacists, despite having the support of the Pharmaceutical Society of Great Britain, and 900 students poised to enter the course.

Another disadvantage listed by Mr Bethel was the restriction on polytechnics of the proportion of senior staff. Although universities are allowed up to 40 per cent of staff on grades equivalent to the polytechnics' principal lecturers, readers and above, the public sector was held down to around 25 per cent. "This is a positive disincentive for polytechnic staff to improve their performance", he said.

The different methods of funding institutions was the other main grievance listed by Mr Bethel, the new proposals for overseas students

Knighthood for Professor Beloff



Max Beloff: a knighthood.

The first principal of Britain's only independent university, Professor Max Beloff, has been knighted in the New Year Honours List.

A distinguished historian who was formerly Glendon professor of government at the University of Oxford, Beloff has been at the University of London since 1974. He is due to retire this year.

Other knights in the academic field are Sir Harry Barnes, director (principal) of the Glasgow School of Art since 1974, and Mr John Ellis, general physician and dean of the London Hospital Medical College, who is also editor of the *British Journal of Medical Education*.

Also knighted are Professor Michael Postan, emeritus professor of economic history at Cambridge University, and Professor William Trechman, professor of psychology at Birmingham University.

Mr David Parish, chairman of the City and Guilds London Institute, has been knighted for services to education.

Among new CBEs are Mr John Barnett, principal of the College of Ripon and York St John, and Professor William Bessley, professor of history of the Far East and head of the Japan research centre in the School of Oriental and African Studies at London University.

Other CBEs are Professor Joseph Black, head of the school of engineering at Bath University, Professor Alesair Steele-Bodger, professor of veterinary clinical studies at Cambridge University, Professor William Burcham, Oliver Lodge professor of physics at Birmingham University and Professor Thomas Williams, professor of civil engineering at Southampton University.

British Council awaits the news from Whitehall

The British Council is expected to learn the outcome of a Whitehall review of its future in a few weeks. By the end of this month or early in February the council will almost certainly have been told of the conclusions reached by Ministers—and whether it will face still further expenditure cuts.

The report of the interdepartmental committee is expected in Ministers' hands. Although the council was closely involved with the work of the review, it has had no part in any decision-making and will have to wait to know its fate.

The council's fall in income from the 11.5 per cent cut in its 1980-81 budget, which when redundancies are taken into account is likely to mean a real cut of at least 14 per cent.

In a House of Lords debate before Christmas Lord Hume of Lusby gave an informed account of the impact on the council of the current cuts. Three specific schemes for scientific and university interchange with the Indian sub-continent were also being marked down for termination, he understood. In the UK the regional network of the council would have to be cut by 25 per cent.

The council has also been forced to have its scholarship programme cut its budget for overseas libraries and periodicals for overseas libraries by 40 per cent, and cut its book exhibition work by 20 per cent.

If Ministers decide that more cuts for future years are needed, the council warns that staff reductions and office closures etc. are inevitable. Sir John Ewellyn, director general of the council, said that English language teaching for 42,000 students abroad would be endangered.

It was this aspect which two leading Conservative peers singled out for particular comment in the Lords debate. Lord Hume of Lusby, the former Prime Minister, said that the council was the service of the country and every nerve to keep it intact. And Viscount Eccles, former Education Minister, suggested the council should either engage more widely in English teaching or go into partnership with private agencies, such as International House.

The council's strongest champion in the debate was Lord Goodham, who said it conducted its affairs with exemplary economy. He felt it was a remarkable indication of penny-wise-pound foolish that the council should be subjected to such economies. "It would be a great overvalued and to economize was an awful mistake."

The Government was adamant the council could not be excluded from the need for further economies over a wide field. But Lord Fraser, the Government spokesman, agreed the council was Britain's main instrument of cultural diplomacy.

LSE plans to plead a special case

Alone of all universities, Bath, because of the cutbacks and considers it may even benefit from the new funding policy on overseas students.

Mr R. W. Holder, treasurer of the University of Bath, says in his report to Court that the finances "are running on the basis that 'one day the money had to stop'". Britain was no longer one of the wealthiest countries and would have to face harsh reality.

He said: "And so we have not been taken by surprise, nor is there likely to be any dramatic tightening or curtailment of activity in the university."

"We are already, as I understand it, probably the most cost-effective university out of the 47 in the United Kingdom and, if quality in return for investment is a criterion for the allocation of funds, Bath must always be at the top of the list."

He said that although he could give no assurances as to future overseas intakes, he would be surprised if the quality and number of these students fell below the limits set in previous years.

Professor Dahrendorf: "We are asking Government to give us a chance to deal by not adding further damaging measures to those already taken."

The response of the London School of Economics to the current financial situation will be to plead a special case, Professor Ralf Dahrendorf, says in his annual report.

"We are not asking Government to let us down," he claims. "We are asking Government to give us a chance to deal by not adding those damaging measures to those already taken. The LSE made a unique contribution to higher education and research and should not be prevented from doing what it could do."

In the coming year the school's reserves would have to be run down to a dangerous extent, even if large cuts were more severe than those made in 1975. But says Professor Dahrendorf, the school still maintains the principles that there should be no redundancies on account of savings, and there will be continued promotion on merit and equitable sharing of the burden.

Professor Dahrendorf maintains that the LSE would not be forced to change its character. It would avoid the easy road to survival of student numbers and overseas students. It is likely there will be a growth in the number of mature students.

The LSE 1980-81 Budget, which is being discussed by the Council, is designed to help the first 1000 students during the next decade, is to be launched later this year, the report says. The figures will have increased to 20 per cent of the total.

He says that there might be a case for setting up a laboratory to work out a medium-term plan for the LSE, to look at the prospects in the light of the unique contribution of LSE has to make.

According to the report, 1978-79 progress which ended in a series of shocks. This year will be difficult, he would not be surprising. In his next report, he would refer to the widening gap between the needs of the world and the domestic market.

Support for LSE's Business History Unit

by Charlotte Barry

Overwhelming support for the Business History Unit, established in August 1978 within the London School of Economics and Imperial College, has come from businesses and research councils.

An initial appeal for care funds of £200,000 has raised more than £223,000 from the business world, and research councils and overseas foundations have granted a further £250,000 for specific projects.

The unit's first report, just published, expresses the hope that the new unit will start to encourage businesses to contribute more, and enable further developments over its first seven-year period.

Dr Leslie Hannah, the unit's full-time director since January 1979, said the first year had been an exciting and challenging one, as establishment of the unit marked one of the few areas of expansion in the social sciences.

"I think that the political changes that are taking place are actually favouring us," he said. "Most of the staff appointed so far are young men anxious to go into a new field. There's an atmosphere about it all that one remembers in the last days of education."

Dr Hannah added that they had found that businesses were quite sensitive about their image. Many thought that the work being carried out by the unit might do something to improve it, and were being very cooperative in giving access to materials.

"Some have been really quite interested in this as not just another area of public relations, but as a way of having more intelligent discussion about the role of entrepreneurs and businessmen."

The unit's primary aim is to act as a centre within the UK for the development of work in the field of business history. It emphasizes the wide range of subjects, building on the history of individual companies.

For this being the activities of the unit are concentrated on the LSE where there are three main areas of research.

The first is a history of the growth of the profession of management in the twentieth century. Papers of a management research group involving a number of leading British companies have been made available to the unit as a study of the views of board members and senior managers on contemporary issues from 1920-70.

A Social Science Research Council grant of £442,000 for staff are employed on a five-year project to study English and Welsh entrepreneurs and managers since the 1600s. They will, like with a detailed study of Scotland being conducted at Glasgow University. The second area will be a study of the volume of business history.

The third major piece of research is a survey of continental European business history, drawing on a quantitative analysis of developments and trends in the European borders and factors contributing to their success or failure.

Adult literacy scheme needs flexibility

The need for a flexible adult education system equipped to meet unfulfilled educational demands is emphasized in a critical policy statement made by the National Federation of Voluntary Literacy Schemes.

The newly published document, which represents the views of more than 40 organizations working in the voluntary sector, reinforces the need for the adult education system to be more responsive to the needs of all young people at school and adequately equipped to cope with the rest of their lives.

"There is no single system of education which could conceivably meet all the needs of all young people at school and adequately equipped to cope with the rest of their lives," it states. "It is essential that the adult education system in this country is not responsive or sensitive enough to this situation."

Emphasizing the special needs of groups learning the basic skills, the document calls for an expanded and secure adult education service built round paid release, non-duty grants, workplace provision and creche facilities for all.

It also stresses the valuable contribution the voluntary sector has made to basic education over the past few years. "This contribution stems from the voluntary sector's flexibility and willingness to take risks, as well as its emphasis on student-centred provision and its work in demythologizing education."

Unfortunately a number of voluntary organizations in the adult literacy field have serious financial problems following the loss of grant aid from the Adult Literacy Resource Agency after it closed in 1978.

The work is being directed by Dr John Ermisch, an economist and research fellow at PSI, and sponsored by the Simon Population Trust and the Sir Helley Stewart Trust. An advisory group is to be chaired by Sir Charles Carter who is already chairman of the Institute's research and management committee.

The study will place British population trends in an historical and international context, analyse the factors influencing the size and structure of the population, assess the likely developments of population structure over the remainder of the century, and examine the implications of the demographic developments and discuss policies for adaptation. A report will be produced in 1982.

Women's studies degree at Kent

by Charlotte Barry

Britain's first-ever course in women's studies leading to a postgraduate MA degree is being introduced next year at Kent University's faculty of social sciences.

About 20 students who must have a good degree in any human or social science, will be taught by 10 academics, both women and men from a variety of disciplines.

The one-year course will revolve round a compulsory core course on the theory and development of feminism. Students will also take a number of optional courses from a list which includes studies of women and the welfare state, women and the labour market, and the history of women's movements.

The course is being co-ordinated by sociology lecturer Dr Mary Evans, who has been teaching an undergraduate option on women to society and organizing a women's studies seminar at Kent since a few years ago.

Although there are now women's studies courses at many levels in different educational institutions throughout the country, they tend to concentrate solely on aspects of the subject.

"We thought it particular there was a real need for a course and also specialist courses, something more ambitious and comprehensive than what is currently available," said Dr Evans.

The growth of the women's movement over the past 10 years has been a major factor in the widening social role of women outside the family and domestic sphere.

Kent and Durham's five year warning

British universities made a major mistake five years ago, when they refused to deal with the impact of overseas students, Dr Geoffrey Templeman, vice-chancellor of Kent University, says in his annual report.

"We are not asking Government to let us down," he claims. "We are asking Government to give us a chance to deal by not adding those damaging measures to those already taken. The LSE made a unique contribution to higher education and research and should not be prevented from doing what it could do."

In the coming year the school's reserves would have to be run down to a dangerous extent, even if large cuts were more severe than those made in 1975. But says Professor Dahrendorf, the school still maintains the principles that there should be no redundancies on account of savings, and there will be continued promotion on merit and equitable sharing of the burden.

Professor Dahrendorf maintains that the LSE would not be forced to change its character. It would avoid the easy road to survival of student numbers and overseas students. It is likely there will be a growth in the number of mature students.

The LSE 1980-81 Budget, which is being discussed by the Council, is designed to help the first 1000 students during the next decade, is to be launched later this year, the report says. The figures will have increased to 20 per cent of the total.

He says that there might be a case for setting up a laboratory to work out a medium-term plan for the LSE, to look at the prospects in the light of the unique contribution of LSE has to make.

According to the report, 1978-79 progress which ended in a series of shocks. This year will be difficult, he would not be surprising. In his next report, he would refer to the widening gap between the needs of the world and the domestic market.

Brunel fears loss of 500 students

Brunel University would have a cutback on its student population by more than 500 by 1983/4 if funding is imposed, it has said in its annual report.

In its response to questions on the effects of different financial policies for the next four years, the university summarized the possible different outcomes in three numbers.

If the same number of overseas students continued to come (300), and they paid level funding fees of £3,750 per annum, then the number of students would remain about the same at 3,050.

If, at the other extreme, no overseas students were prepared to pay the new fees, total numbers would need to contract to about 2,000.

In fact the Brunel estimate is halfway between these figures: 2,140 full-time homes, 180 full-time overseas and 220 full-time equivalent part-time making a total of 2,540 in 1983/4.

Brunel says that in the general context of the university's financial position, the loss of 500 students would be a disaster. The university had been planning for a succession of years, ranging from 3,500 students in 1978-79 to 5,000 in the mid-eighties, down to the 2,500 level envisaged by the committee last year.

With a 500-year cut, the university would be in a very difficult position. It would be unable to maintain its standards and its reputation. It would be unable to maintain its research and its teaching. It would be unable to maintain its facilities and its equipment. It would be unable to maintain its staff and its services. It would be unable to maintain its identity and its mission.

Survey on British population trends

An analytical review of British population trends and an assessment of their social and economic implications is to be carried out by the Independent Policy Studies Institute in London.

The work is being directed by Dr John Ermisch, an economist and research fellow at PSI, and sponsored by the Simon Population Trust and the Sir Helley Stewart Trust. An advisory group is to be chaired by Sir Charles Carter who is already chairman of the Institute's research and management committee.

The study will place British population trends in an historical and international context, analyse the factors influencing the size and structure of the population, assess the likely developments of population structure over the remainder of the century, and examine the implications of the demographic developments and discuss policies for adaptation. A report will be produced in 1982.

In the third of a series on intellectual pressure groups Dr. J. R. Ravetz looks at the BSSRS

Loneliness of the society for responsibility in science

University scientists are likely to be surprised to find their profession described in these terms. "Science," technology, presently organized around and intended to strengthen both capitalist social relations of production, distribution and exchange, and the ruling class's hegemony within this society. The ideological aspect of this rule, includes "capitalism, patriarchy and imperialism," and the material and psychic rewards "that predominantly white male scientists" derive from the scientific expression of blacks and females.

The author of this unflattering portrait is one of the small but hardy group of academics, each with a solid reputation in her or his own research, who give intellectual substance to the radical criticisms of the British Society for Responsibility in Science (BSSRS). The Society has just completed its tenth anniversary celebrations, and seems in no danger of extinction. It is worth considering, if only as a mirror (however distorting it may be) by which academic scientists may take a look at themselves from outside. For this we may use the explicit critical message of BSSRS and of other organizations on the radical fringe of science, and also the fact of its being totally isolated from the "scientific community" here.

BSSRS was founded in 1969, after a gap of just 30 years in organized criticism of science from a socialist perspective. A mixture of diverse forces and motives led to its formation. The very respectable-sounding title may derive from its direct origins: a circular letter, signed by some hundred academics mainly of science, calling attention to the problems of social responsibility in science. But others, who actively promoted it, were motivated by 1960s radical euphoria and the dream of mobilizing the key workers of contemporary science-based society.

On other issues, the BSSRS cannot build up the large membership among scientific workers that its founders had expected, and for some years it mainly functioned as a clearing-house of ideas and projects among radicals who happened to be involved in science. Provincial branches, which tended to be less political than the centre, came and went. Radical elements attempted a rather revolutionary alternative; and moderates eventually found social and financial support for a would-be "corporate conscience of the scientific community" in the Council for Science and Society.

But after some years of turbulence, BSSRS created a job for itself to do, and so identity, which gave it a stable, if somewhat lonely existence. Put crudely, this may be called "Science for the Workers". For, by the late 1970s the changes to be wrought by the Health and Safety at Work Act were becoming realized; and BSSRS saw the possibility of a radical action that would be appreciated on the shop-floor: education and agitation on workplace hazards.

To most academics, this may seem far from "science". But there are several real connections. First, most academics do not, and would prefer not to, realize the conditions in which many workers must spend their lives: the combined assaults on bodies and minds through noise, chemicals, and mechanical hazards. Nor is it easy to believe how, "until very recently", we have had very many employers who cared little for these problems, a toothless Factory Inspectorate and compensation regulations directed and operated against the interests of workers. "Science" is not, by itself, an absence: research on hazards, both absolutely and in comparison to R & D on trivial, unnecessary or deleterious products, is patently excluded.

A hazardous group of BSSRS has produced a set of radical effective pamphlets, published a regular *Hazards Bulletin*, and organized groups in several places. It is a commentary on the state of the labouring students' movements that this is not in such activities, which would be an ideal education for politically-committed science or technology students: are left to small groups of activists totally outside the universities.

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Dilemma of rescue versus research

Philip Rahtz on the great debate among archaeologists of whether to excavate now or wait for improved techniques

For many years British archaeology has been dominated by rescue archaeology. Thousands of sites were and are being destroyed. Archaeology has expanded rapidly to meet the challenge, to save as much as possible of the nation's archaeological heritage for posterity. The argument is familiar, and results in large-scale funding, especially by Central Government, and the formation of archaeological units in towns and counties. "Safe" sites, it is felt, can be left alone until the age of destruction is over. In any case, it is argued, the longer they are left, the better they will be, because of increasing technical resources, that is, information would thus ultimately be available to future generations.

There have always, however, been counter-arguments, voiced notably by academics, that rescue archaeology does not further research in a systematic manner, that it is largely random in the data it generates. Some unthreatened sites, it is also argued, should be dug to answer specific problems or to provide particular sets of data. It is also felt that the hurried and deliberate research excavations that only chance of developing new field techniques of archaeology.

This is not in fact altogether true—the finest excavation ever done in this country, that of the Anglo-Saxon palace and folk-centre at Yeaveley, was a rescue dig. It has, now that it is published, set new standards of excavation and analysis. Cheddar, another Saxon palace, was likewise excavated because of its archaeological importance. It would have figured prominently in any planned programme of research.

Another problem with research excavation is that it is very difficult to finance on an adequate scale, since most resources are geared to rescue. Any site that is not being researched or raised, even if it is increasingly tended to be the best but among the worst of excavations. Archaeologists have not been slow to realise that if they are to forward their subject to the rescue of a "safe" site, they must "use rescue for research". This has been done by attempting to excavate well ahead of destruction, so that the work can be done with every care. An example of this is the great Saxon excavation at Coppergate in York, where Richard Hall is now in his third continuous year of digging and will go on until development begins late in 1980. Indeed, the policy of the York Archaeological Trust is to look well ahead at the threat to York's archaeology, to choose those sites which would be in the front-line of research and to excavate them properly.

In the financing of excavations, the Department of the Environment has gone rather further with its attempts to introduce more, and into the large sector of British archaeology it controls. It has now agreed to use public money to finance the examination of certain sites, where it can be shown that their excavation would help in the interpretation of others which are being or have been destroyed.

The final stage in this attempt to make research of rescue has recently been achieved by Dr Ann Ellison. She is a Cambridge-trained archaeologist, a student of the late David Clark, who did more than anyone else to give British archaeology a sound theoretical basis, and has recently been appointed director of the newly formed Wessex Archaeological Unit. Within a few months she has produced a master-plan, in which most of the rescue excavations, such as those at Stonehenge, Avebury, and other sites, are to be carried out in a more systematic way, and possibly in a more integrated way, with the excavation of other sites related to the kingdom of Wessex, such as the royal palace at Stonehenge, where, as Dr Ellison tells us, King Raelwald died after a battle with the devil and where there was a royal baptism in 664.

Here perhaps is another Yeaveley. At Ipswich recent excavations have shown that the Saxon town flourished at the same time, it has now been associated with the political and economic importance of East Angles in the seventh century. Field work and aerial photography on the site of the Saxon town at Ipswich, in the valley of the Orwell, around Woodbridge, Paul Ashby, of the University of East Angles, sums up the

approach as "an interdisciplinary programme of field and other studies, with its ultimate objective the archaeological and historical profile of Raelwald's kingdom, its dynasty, its earlier origins, as prehistoric finds suggest? Yeaveley had its origins in a stone circle, and Sutton Hoo may also be an example of the continuing importance of an ancient religious site. Only by such excavation can we answer such questions and provide more data on such crucial subjects as the history of marine navigation in this period, and indeed of the political, social and economic basis of the East Anglian kingdom.

There are thus strong academic arguments for further work on the site. Even if the operation were costly, such a prestigious site should attract enough funds to mount an excavation of the highest quality possible, and there is at present considerable local support. More mundanely the site is also in some danger from burrowing rabbits and the depredations of metal-detectors. It is then to some extent threatened by the very thing which has made it so important: its archaeological value. With adequate legal and police protection, or even deliberate burial of the whole site under an envelope of clay could overcome these problems. One objection comes from two camps. The first believes that the site should be "frozen" indefinitely and that we should concentrate our efforts on much wider problems of settlement and "ordinary" cemeteries. Irrespective of rescue or research, the second believes that the site should be left as it is, but not yet. The final publication of the great ship-burial should be fully digested by the present generation of scholars before informed decisions can be made about further excavation, and that we should also await full reports on other princely burials, such as Taplow and Broomfield, which the British Museum has in hand. It does not believe techniques are sufficiently advanced not that a dig could be mounted with tomorrow's standards rather than today's. And who would direct the work? Should such an important site be an international project rather than just a British one? Every one agrees, however, that whether further excavation is dug or not, the whole question needs to be put into a wider context by intensive field survey and possibly excavation of other sites related to the kingdom of East Angles, such as the royal palace at Stonehenge, where, as Dr Ellison tells us, King Raelwald died after a battle with the devil and where there was a royal baptism in 664.

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What the binary system means to employers

David Benton, Michael Gruneberg and Christopher Bacon analyse the answers to a questionnaire

It has been suggested that a binary system in higher education can be justified only if the polytechnics provide something different, or meet a need at present unmet by the universities. The White Paper, which in 1969 proposed the creation of polytechnics, saw them as costing less than traditional universities, and producing people qualified for skilled roles in industry and administration. While the objectives of polytechnics have been seen as different from universities, the relative status has been described as a "parity of esteem". If the binary system is to work it is essential that the concept is understood, accepted and operationalised by all those concerned. Is there a "parity of esteem"? It is important that the status of university and polytechnic qualifications be seen to be equal in the eyes of employers. Recently we have compared, using a questionnaire, the ways in which employers view the graduates produced by both universities and polytechnics. In particular we have explored employers' perceptions of the social and intellectual qualities of these two types of graduate and the value to the organisations which employ them.

The views of 86 representatives of industrial and commercial organisations were sampled when they judged a number of polytechnic and university graduates to be of similar value. When asked to judge the relative quality of university and polytechnic students, 77 per cent thought that academically the university graduates were better. This was particularly true of graduates in the sciences, where 83 per cent thought that university graduates were better. However, when asked to judge the relative quality of university and polytechnic students, 77 per cent thought that academically the university graduates were better. This was particularly true of graduates in the sciences, where 83 per cent thought that university graduates were better.

most common reason specified to account for the perceived difference, although ample evidence of lower standards of courses and teaching, and a general attitude of indifference to the quality of polytechnic students.

Employers were also asked to specify the personal qualities for which they were looking during an interview. The most frequently mentioned quality sought by the interviewers of university students was drive and motivation (mentioned by 64 per cent of employers), and leadership potential (46 per cent). When interviewing polytechnic students, employers (59 per cent) drove and motivation (58 per cent) were the most frequently mentioned characteristics. It is interesting to note that the finding was the same for both types of graduates, and that the same qualities were sought by both university and polytechnic students.

little idea of the realities of industry and most of them have not been there at university. However, by and large, most university students have a long-term intellectual advantage over polytechnic students.

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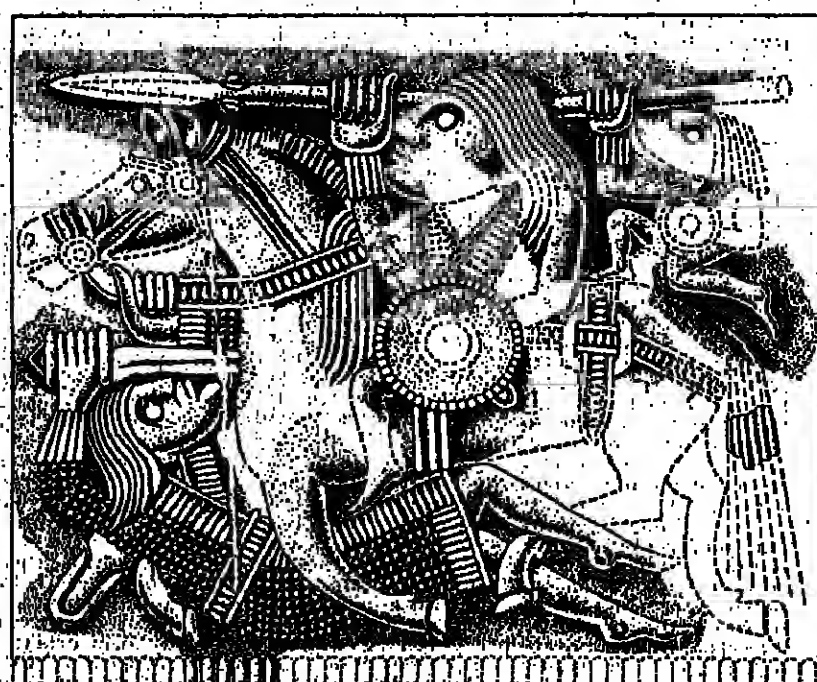
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New reconstruction of the Sutton Hoo helmet.



Reconstruction of part of the Sutton Hoo helmet decoration.

BOOKS

An assessment of relative deprivation

Poverty in the United Kingdom: a survey of household resources and standards of living
by Peter Townsend
Penguin, £7.95
ISBN 0 14 021395 5

With this massive book Peter Townsend has at last delivered the fruits of his poverty survey together with reflections on subsequent evidence and on policy. The survey's long gestation period is not remarkable, but its cheapness is, and I draw to the attention of those who are prone to criticize the costs of social science research.

The meat of the book is, of course, the survey which will forever be of value to those wishing to know the quality and extent of poverty in the United Kingdom in the late 1960s. The 1970s dressing is relatively unimportant and prompts one to ask whether a bold account of the survey's findings would not have made a better book. Possibly, but this is not

merely a scholarly tome and we must expect anything from Peter Townsend's pen to be both contemporary and committed. Once the poverty line has been drawn, a simple "head count" of individuals, income units or households gives us the proportion in poverty. Townsend's favourite categorization is relative deprivation, defined as "the absence or inadequacy of those desirable amenities, standards, services and activities which are common or customary in society". My own preference would be for the relative income measure, provided this was defined in the proper Townsendian manner of common sense and resources, including wealth and access to the social services. To arrive at relative deprivation an index is derived from manifest deprivation, some of which it would be absurd to take as indicating poverty by themselves. For example, "has not had a cooked breakfast most days of the week". The poorer the household the higher the deprivation index; in-

deed the survey's discovery of a close inverse relationship between income and deprivation is emphasized at various points in the book. Thus in chapter nine on "the rich" Townsend notes "the powerful relationship between subjective manifestations of deprivation, and sheer lack of money resources, and wealth, which underlies perceptions of personal deprivation" and "inequality in the distribution of net income worth is even more strongly associated with deprivation in housing". Is the relationship sufficiently close to enable us to abandon Townsend's measure and settle instead for a straightforward index of net income-worth? I suspect not, especially as the "sharp break" in the relationship between income and deprivation could easily be made to vanish by taking the log of the deprivation index score, for example.

I have space here to mention only a few of the many good things in this book, but I would like to make three points: first, that the

politically derived indices of deprivation (see appendix 13) are useful in their own right even if not needed as indices of poverty; second, that success in obtaining information about assets was a remarkable achievement; and third, that though Townsend devoted many chapters to minority groups he has not allowed this to obscure that even within such groups poverty is of uneven incidence.

Yet I take issue with Peter Townsend on both the politics and political economy of poverty. Does he really believe that a high figure for those in poverty (22.9 per cent) will galvanize sympathetic politicians into adopting some programme of the sort he outlines? This air-point programme has a utopian air about it: "Abolition of excessive wealth", "abolition of excessive income". If we really wanted to abolish poverty we could do so very quickly. Not inconsiderable benefits, tailored to "need" (a needs-test rather than a means-

test), set at somewhat above the minimum benefit rate, financed out of general taxes, would do the trick. Why does not happen? Is it, as Townsend thinks, because of "a desire to preserve and enhance wealth and so deny it to the hegemony of our formal institutions to capital and so on? Is it because the median income is reluctant to pay any taxes? If so, the relief of raising the "poverty ceiling" and the typical vote-raising him that relief is really all that expensive.

Peter Townsend's book rapidly becomes a "what is" sociological research book, that the most promising further research are to be, that oldest of the social political economy.

David G.

Purse-string committees

Parliament and Public Spending: the expenditure committee of the House of Commons 1970-76
by Ann Robinson
Heinemann Educational, £8.75
ISBN 0 435 83750 8

"No taxation without representation": Parliament's right to control spending by the Crown has been the stuff of revolution and the stuff of independence movements. Have these hard-won rights now slipped into abeyance? Many commentators certainly believe so, and a recent report of the Expenditure Committee suggests it. On only one or two occasions this century has the House of Commons altered the Government's requests to it to authorize spending for the coming year.

As the extent of social spending has grown so has the complexity and importance of the executive's own planning and control process. The Treasury's efforts are frequently criticized and often unfairly given the volatile political and economic climate within which such processes must operate. In contemporary parliamentary scrutiny of public spending has not kept pace either in scope or intensity. The problem was appreciated long enough ago. In 1968 the House of Commons Select Committee on Procedure recommended the creation of a new committee structure for the House of Commons to oversee the expenditure process and in 1970 the new Expenditure Committee and its general and specialist sub-committees were created to research, to the House's power, at least a part of the House's power of scrutiny.

This book, by Ann Robinson, is a study of the House of Commons

Expenditure Committee from its creation through its first six years of work. She recalls the origins of the committee, and the rather vague and varied objectives the reformers had. This confusion of aims was evident from the very beginning. Were the sub-committees to be critics of Government policy and spending priorities? If so they would tend to divide on party lines and lose the influence they might have had if they had spoken with a single "impartial" voice. Should they concentrate on the technical details of the White Paper and bore their fellow MPs? Or should they do much as the old Estimates Committee did? That is, study one fairly narrow area of concern only, the main field of party politics, milk production, say, or the new towns, and produce a full report on such a topic each session? Ann Robinson argues that this confusion has remained largely unresolved. Some sub-committees have pursued one strategy, others another. She looks at what kind of MPs have served on members and how long they remain: the most popular committee appears to be the Defence and External Affairs Committee, largely, she hints, because of the absence of foreign travel it gives. Moreover, as she puts it, "expertise does not appear to be a major qualification for appointment". This is reflected in the level of questioning and grasp of detail shown by the members. Nor, she argues, is this adequately compensated by the limited employment of outside advisers. The attendance and participation of members is enervated and the sources from which evidence is local, largely the civil service, local authority, associations and other public bodies.

All in all, Robinson's conclusion is a depressing one and not assuaged by the conclusions drawn by other critics of the specialist committees. It has not provided effective scrutiny of the Government's public spending plans. Its procedures and expertise might in theory be improved, but at bottom within the present conventions the Commons must remain largely impotent, merely a relatively marginal influence among a great many more. I do not entirely share the author's pessimism. The committee were to confine its role more narrowly and appraise the public expenditure White Paper themselves, the assumptions on which each section is based and the detailed implications, each has for the services involved, it would be doing a major public service. It could improve the quality and realism of public debate. What assumptions are being made, and why, about teachers' pay, wages and salary, cost, equipment and books, building costs, the costs of population decline, geographical and social inequalities, and staying on rates? How have past assumptions related to equal outcomes? This information is that in government not widely technical and certainly not pretentious to the ordinary MP. Each would be worthy of study on its own. Moreover, some of the sub-committees have done a good job on this level already. Whether it is the job of any government to give the committee expertise, that would make such studies really worthwhile is another matter.

Howard Glenister



Mrs Senyashima seen, over night in London, in a photograph taken by Michael Hillis, a Japanese photographer. (Gordon Fraser, £12.95 and £7.95)

In the discomfort of your own home

The Sweated Trades: an account of nineteenth-century British industry
by Richard Bythell
Batsford, £12.50
ISBN 0 7134 1259 3

As the author of a recent general survey of the growth of British industry, I must applaud Dr Bythell's more particular study of the neglected "sweated" industries organized under the "domestic" or "putting-out" system, in the nineteenth and early twentieth centuries. There is no doubt that these widespread and important trades in textile spinning and weaving, clothing, boots and shoes, hat and bonnet-making, and many other home-working trades have long been neglected by comparison with studies of the development of mechanized factory production to the Industrial Revolution. Yet in the nineteenth century, such craftsmen and workers, along with more numerous than they, were engaged in many other trades, including factory operatives, though their numbers gradually dwindled

thereafter until by the early twentieth century they had become a small minority. Dr Bythell has provided a broad and illuminating survey of the main outstanding trades, characterized by the employment of workers in their homes or small domestic workshops, and the third, examining the trade in the light of the social and economic conditions of the time. This is a book of great interest and value, and it is a pity that it is not more widely known. The author has had obvious difficulties in his research, and this is reflected in the book's structure and content. The book is divided into three main parts: the first part provides a general account of the "sweated" trades, the second part examines the trade in the light of the social and economic conditions of the time, and the third part examines the trade in the light of the social and economic conditions of the time.

More debatably, his emphasis on the "sweated" trades is somewhat narrow, and he does not fully explore the wider context of the Industrial Revolution. The book is a valuable contribution to the history of the "sweated" trades, but it is not a comprehensive survey of the Industrial Revolution. The book is a valuable contribution to the history of the "sweated" trades, but it is not a comprehensive survey of the Industrial Revolution. The book is a valuable contribution to the history of the "sweated" trades, but it is not a comprehensive survey of the Industrial Revolution.

trades, when "the phrase 'sweated' was common, and it was not until the late nineteenth century that it was replaced by 'sweated'". The book is a valuable contribution to the history of the "sweated" trades, but it is not a comprehensive survey of the Industrial Revolution. The book is a valuable contribution to the history of the "sweated" trades, but it is not a comprehensive survey of the Industrial Revolution.

BOOKS

Reversible and irreversible systems

Black-Body Theory and the Quantum Discontinuity, 1894-1912
by Thomas Kuhn
Clarendon Press: Oxford University Press, £12.50
ISBN 0 19 502383 8

Thomas Kuhn intended to write a monograph which would span the years 1911 to 1923 and which would deal with the evolution of the "old" quantum theory. Such a monograph would be a background against which the emergence of matrix mechanics, wave mechanics and electron spin in the years 1925 and 1926 could be more clearly seen. Kuhn admits that he intended to begin at the beginning. Any- thing before, say 1911, was to be taken for granted. However, he has not written the book he intended to write. He ends where he had originally intended to begin, at the year 1912.

Books which take their authors by surprise often make good reading. This one does. It plies four strands into one thread: polished historical scholarship, a transparent account of a central problem in physics, a novel and well-drawn character, and a detective story in which the culprit gets away.

The appearance of the world "quantum" in the title may well induce a false expectation. Only the last quarter of the book deals with the quantum as such. The third quarter deals with the recognition that a discontinuous physics is unavoidable, but the first half is devoted to a topic in which the quantum was not sought nor its existence suspected. Indeed, when the constant h first appeared it was not recognized as a quantum, least of all by Planck.

In the first four chapters the fascinating author describes in detail Planck's approach to a problem previously considered by Boltzmann,

namely, what is the agent by which a time-reversible system obeying Newton's laws of motion becomes a time-irreversible system obeying thermodynamic laws, such as Ohm's law and Fourier's law. A reversible system is exemplified by two atoms undergoing an elastic collision. Under Newton's laws, forces are proportional to the second time-derivative of position, and hence are invariant under the transformation $t \rightarrow -t$. An irreversible system is exemplified by a gas, in which many atoms undergo successive binary elastic collisions. Under thermodynamic laws, forces are proportional to the first time-derivative of position and change sign under the transformation $t \rightarrow -t$. Each binary collision in a gas is reversible; it obeys Newton's laws. The gas as a whole is irreversible; it obeys thermodynamic laws. The problem thus faced by Boltzmann was that each element of this system was reversible, but that the sum of the elements was irreversible. Planck began by announcing that Boltzmann's approach to the problem was unsatisfactory and that he would do better. Kuhn examines the series of papers in which Planck was drawn ever closer to Boltzmann, both in method and conclusion. These papers end in a handsome admission of defeat.

The same problem is still with us today, and since it is the subject of half the book, a few remarks seem appropriate. Boltzmann and Planck took the existence of reversible systems as obvious, familiar and given. They phrased their question accordingly. A converse approach is possible, based on an often quoted definition by Planck himself: an irreversible process is a process which, once performed, leaves the world in an altered state. From this definition it follows (at once) that any and every quantity which any scientist has ever measured has been part of an irreversible process. Measurement of the

specific heat of water is part of an irreversible process. Measurement of anything is part of an irreversible process. Planck and Boltzmann's question now stands on its head: the existence of reversible systems is neither obvious nor given. Instead, we must ask what is the condition, the approximation, which, in this irreversible world, permits us to speak of "a reversible process". The necessary condition is that the system which is to be reversible can be isolated from the rest of the universe. The elastic collision of two billiard balls is a reversible process—if we set aside the need for angles to project the two balls into a collision, and if we set aside the fact that after collision the two balls fall to the floor. The condition is an elementary one, but it is overstepped at page 26 of Kuhn's book, in Zermelo's paradox, which asks us to consider an isolated system of unidirectional motion. In this universe there is no such thing, no real physical system can ever be wholly isolated. An Englishman answered Boltzmann's question in the year before Planck started work on it. Irreversibility, said Burbury, is due to "disturbance from without, coming off haphazard". Kuhn records Planck's unsuccessful search for a different answer.

In the course of his search Planck found a radiation law. It had two constants. There is evidence that Planck regarded the significance which could be attached to one of these constants as the constant h in the equation $E = h\nu$, but he did not have in mind the constant h which now carries his name.

The second half of Kuhn's book opens with the recognition by Ehrenfest and Einstein that Planck had discovered a quantum. Putting it in this way, Planck refused to believe it. Chapter eight records the last attempt to preserve a continuous physics, by Lorentz; an attempt which, shot to pieces in

A map of the landscape of physics

The Forces of Nature
by P. C. W. Davies
Cambridge University Press, £12.00
and £2.25 pb
ISBN 0 521 23543 X and 29535 1

All of matter can be understood in terms of four types of force acting between a set of sub-atomic particles. This book tries to illuminate this arrogant, almost brutal, claim of physicists and to show how they justify it and yet struggle to deepen and further simplify.

Dr Davies starts by going quickly through basic mechanics and electromagnetism, so introducing the first two forces, gravity and electricity. Two further forces, the strong and weak nuclear forces, follow, with an explanation of quantum theory and its central role in the understanding of atoms.

These introductory chapters set the scene and an account of the

structure of nuclei completes this part by showing how two further and distinct forces, the strong and weak nuclear forces, are needed.

The focus then shifts to the particles. A few were invented to explain atoms and nuclei, but the author goes on to explain the dialogue of theory with experiment. Results obtained when accelerators produce high-speed collisions between particles, such as the development of a new conceptual world, suffering from a population explosion of more and more types of particles, are listed, and subject to a new canon of conservation and symmetry laws.

Reflection on this new world leads to a fresh examination of the four forces employed in constructing it, and the book ends with sketchy, but interesting, speculations in which the four forces may be understood as manifestations of a single mechanism.

The book is for the non-specialist scientist, for students and for inter-

ested laymen. The latter will be daunted by the introductory chapters, but the rest is accessible and lacks the necessary imagination and flair, while some of the details are not carefully handled. The author could learn from others in this area, such as Eric Rogers in *Physics for the Inquiring Mind* or Paul Matthews in *The Nuclear Apple*. However, it would be a pity if readers were to put the book down at this point. Once Dr Davies embarks on the central theme, his own sense of order shows through in the careful sequence of presentation, and his controlled enthusiasm produces a rising level of interest.

These qualities, applied bravely to a most difficult field, make the final product very rewarding. The new theories of physics, composed of a large number of particles, can be made up of all other particles in a shifting world of transmuted identities. At the same time, the possibility of a physicist's El Dorado, the unification of the four

forces, begins to emerge.

Such developments may lead to profound changes in theoretical physics. The Kuhnian revolution of the past, they could provide a new diet for the philosopher. For example, what is the status of a model of quarks which might include as intrinsic the property that they can never be detected? On a larger scale, Dr Davies asks why nature produces a rich profusion of particles when only four appear to be needed for the everyday properties of matter—in what sense, if at all, is this a legitimate question?

More striking still is his closing comment that the world is undoubtedly "a manifestation of something very very clever indeed". It says much for the power of Dr Davies's language that where every particle can be made up of all other particles in a shifting world of transmuted identities. At the same time, the possibility of a physicist's El Dorado, the unification of the four

Ross Hesketh

Bridging undergraduate and research levels

The Physics of Vibration, volume one
by A. H. England
Cambridge University Press, £22.50
ISBN 0 521 21899 3

Vibrations are of importance in many contexts such as the motion of a pendulum, electric circuit theory and the behaviour of biological populations. So it is necessary to understand the various possible types from both a theoretical and a practical standpoint. Many books with different approaches to the subject already exist both at undergraduate and research levels. This one is written from the viewpoint of a physicist and is intended to bridge the gap between what every scientist should know and what only the dedicated expert can understand.

In chapter one the author introduces the subject and sets out his

mainly through rotation or the presence of a magnetic field are considered in chapter eight and nuclear magnetic resonance is examined in some depth.

The principal features of phase plane analysis of nonlinear differential equations are highlighted in chapter nine and a number of applications of these methods to linear and nonlinear equations are presented in chapters 10, 11 and 12. Chapter 13 is devoted to parametric excitation, and problems of the pendulum of variable length are considered. The critical case is examined in some detail. The effects of feedback and negative resistance are discussed in chapter 11, and chapter 12 is concerned with coupled vibrations.

Examples are included from many branches of physics and from other areas such as the performance of structural instruments, in the main, examples are chosen from

a number of fields: mechanics, the behaviour of lasers, and so on. The author has a pleasant, clear style of writing and numerous figures and graphs are included. Easy to follow forward and back reference are included wherever necessary.

The presentation is most likely to appeal to the physicist, since the practical problems are not discussed from the viewpoint of the engineer and mathematician is introduced only to the extent that it illuminates the physics. At times the author's over critical of mathematical claims for avoiding the really difficult problems. However, there is still much in the book that will stimulate the thinking of engineers and mathematicians.

The author certainly achieves his objective of bridging the gap between the undergraduate and research levels.

George Eason

Phyla

The Invertebrates
by R. McNeill Alexander
Cambridge University Press, £28.00
and £7.50 pb
ISBN 0 521 22120 X and 29361 8

A Life of Invertebrates
by W. D. Russell-Hunter
Collins-Macmillan, £12.75
ISBN 0 02 404620 5

Unlike their predecessors, modern courses in invertebrate zoology tend to be sherry and rather basic. They face teachers with a particular dilemma, namely that of instilling an adequate familiarity with the structure, organization, diversity and evolution of the phyla while at the same time doing justice to the very considerable advances in the understanding of animal function that have been made in recent years. This dilemma is compounded by the fact that, very often, a course has to be both self-sufficient for students who will do no further zoology, and a secure foundation for students who will continue with more advanced courses.

The publication during 1979 of these two books, one entirely new, the other a substantially revised and extended version of earlier paperback volumes, will have been welcomed by teachers seeking suitable texts to accompany their courses. Both books are designed to provide an introduction to the structure and function of invertebrates without overloading the reader with the kind of morphological and systematic detail that is readily available elsewhere. Both cover much the same ground, in terms of phyla, and both place emphasis on those phyla which have received the most intense experimental study. Despite these similarities, however, the individual interests and expertise of the authors have ensured that the books differ quite strikingly.

McNeill Alexander is concerned with describing animals as they are now and with how they work. For each phylum there is a brief synopsis and description of the typical or familiar examples, followed by a more detailed and extensive treatment of those aspects of its biology which have been illuminated by recent research.

These latter sections include brief and clear accounts of the experimental techniques upon which the data are based and the data are described and analysed, often in simple mathematical terms. At the end of each chapter there are references both to comprehensive texts and to original research papers. Naturally there is considerable emphasis upon analysis of functions in physical and chemical terms, and upon locomotion, mechanics, but physiology, ecology and ethology are also considered where appropriate.

Russell-Hunter's treatment of the invertebrates is similarly concerned with the phyla as they are, but there is a much greater emphasis on their evolutionary interrelationships and, as his preface puts it, on their varying "life styles". For a number of phyla he is made of archetypes to describe basic organizational features and these archetypes are then compared with the diversity of extant species. Though topics such as locomotion, mechanics, and physiology are included, they are given a somewhat less detailed treatment than in Alexander's book. In contrast ecological topics, and particularly marine biology, receive a greater emphasis.

Both books will be useful to teachers and students alike in that their contents complement one another. Russell-Hunter provides a more comprehensive overview of the invertebrates and a strong evolutionary framework. McNeill Alexander largely ignores questions of phylogeny but gives, in a convenient form, much detailed functional information about functional aspects of invertebrates. A Life of Invertebrates is abundantly illustrated with line diagrams and many line photographs. The illustrations in The Invertebrates I found rather disappointing: there are no photographs and the majority of the figures are redrawn from other sources. It is difficult to understand why this should be the case, despite the fact that the paperback edition is relatively inexpensive. Nevertheless, both are "good buys".

Derek Wakelin



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Union View

Coping with the climate of pessimism



David Aaronovitch

A piece of graffiti to be found somewhere in Reading University says: "1980 will make 1984 look like 1968. If this sounds excessively gloomy it overstates the pessimism felt by many who, until May of last year, felt that some of their favoured educational projects of last stood a chance of becoming reality. Its that grants for the 16-19s was only to be a limited pilot scheme, that the Cocks Report recommendations fell far short of what was desired and that the Government had not outlined exactly what its thinking was on "Model B"—the continuation of places in higher education on the reverse side of the hump. Some of us also felt, while welcoming the Youth Opportunities Programme, that an over-concentration on the Work Experience (WEEP) com-

ponent might lead to a serious distortion in the educational and training purposes behind the programme. Nevertheless, we were optimistic, and this optimism, partially allowed a change in orientation of organizations like NUS from a role of pure oppositionalism to that of constructive critic.

It seems to me that there are three major ways in which educationalists can cope with the present climate of pessimism. The first is to argue, as Dr Broson has done in the columns of this paper, that the Government in its attitude towards education has tapped a basic "instinct" within the British people and that we had better knuckle under. The second way is to admit the inevitability of crippling cutbacks in educational expenditure but for each section to argue for a mitigation of its effects in their own particular area. Thus we could envisage a series of highly defensive battles fought around sectional demands, which however worthy (such as the battle for employment) take place long after the ideological stable door has been closed.

As is usual in these polemics, it is the third way, that of creating an "alternative" plan for education, that NUS espouses. It is my belief that public hostility towards education has been much exaggerated. There remains to be created within the community a powerful lobby for education which could help to have a decisive effect on government thinking. The essential question therefore is under what circumstances can those of us involved in education assist the creation, and articulation of such a lobby?

At our last conference in December, largely unnoticed in press reports which concentrated on the barracking of the mayor of Blackpool and the visit of Derek Robinson, a motion was passed which included the resolution that the executive should draw up a manifesto for education. This document is to provide the theoretical basis for a student campaign in the institutions and the community on the sort of higher and further education system that Britain needs in the eighties.

It is our belief that much public antipathy towards post-school education exists because of its exclusivism. It follows from this that any campaign that seeks only to defend the status quo will find it difficult

to attract the level of support that it requires to be successful. In order then to create a general atmosphere which is pro-education what has to be fought for is an extension of educational provision to those who do not, at present, enjoy it. The manifesto will seek to outline the fact that technological and social changes will require a transformed education system much better able to meet individual social and economic needs. Drawing together the different elements of NUS's education policy we will try to pose a notional alternative which does meet these needs. The manifesto should then address itself in the sort of alternatives required at a local and institutional level. We will basically be arguing that students and others should create development plans for colleges that draw in individuals and organizations within the community and commit them to institutional development.



There are three main areas for development in localities: access, curriculum and democracy. The manifesto will call for a greater attention in all colleges to local educational needs as defined by a fairly wide cross-section of local thought, curriculum development to support this, and an opening up of representative structures to take account of, and to plan these changes.

I restate my belief that with cooperation between those of us involved in education in the creation of alternatives that can appeal to a wider public means that we could avoid the pitfalls of defeatism, sectionalism and that mindless militancy which NUS is so often, unjustly, accused of.

Otherwise 1980 looks like being the beginning of a very bleak decade for further and higher education.

The author is deputy president of the National Union of Students.

There is still a demand for graduates

Gloom is the prevailing economic mood as I write this article (a few days before Christmas). Unemployment, rising unemployment, severe contraction and closure facing a major industry are only some of the factors which combine to encourage that mood. Clearly anyone who writes in these circumstances on the subject of employment prospects is a fool if he does not recognize that much of it is wholly justified. Furthermore, since many of the omens are bad, even the signs which give cause for optimism have to be viewed with caution: things could—may—change for the worse.

The signs are there nevertheless. From my vantage point the most encouraging is in the fact that employers, especially industrial employers, are still seeking graduate recruits. Indeed, the demand appears to be little different in volume from that of 1978-79, which was a record year. We in Cambridge have been notified of just about the same number of vacancies from the same number of employers, as at this stage of the last academic year. The number of employers who made enquiries was a record. The number who have booked to come in early 1980 is slightly higher.

Of course all this needs qualification. Cambridge is not typical. Projects, visits, and projected recruitment, may not materialize. There could be a repetition of the situation in the early 1970s when many industrial employers stopped recruiting.

That is true, but such developments would be what seems to be the current mood. In recent weeks I have been engaged in discussions with several major firms who are genuinely and enthusiastically keen to develop better understanding of industry among those in the universities, a keeness which extends

beyond a simple recruiting operation. Numerous conversations during the past year have revealed so urgent wish on the part of employers, even those in the most volatile sectors of the economy, to avoid a repetition of the early 1970s cutback. This wish reflects the fact that one result of that cutback was to create in many able graduates an antipathy to industry which was not reversed for several years.

It has been reversed, as figures for entry to industry in the past four years show. In Cambridge, for example, the proportion of the graduating population entering manufacturing industry rose from 7.5 per cent of those whose destinations were known in 1975 to 12.2 per cent in 1978. There are various causes of the present trend of interest which are national, not just local. One of the main ones being the manifest seriousness with which industrial leaders are now viewing the recruitment of able graduates. I say now, because in the earlier period the opposite was sometimes the case. Pretty obviously the need to recruit such people is real. Some at least of the country's problems are attributable to the dearth of able, innovative people going into manufacturing industry, and particularly into production management. The Flanniston Committee, a forerunner of whose report has been repeatedly cited in this newspaper, is looking at the training of engineers.

To have more good and relevant training, engineers and other educational institutions could reasonably be expected to address themselves. Unfortunately faced with "grave financial difficulties" and the uncertainties induced by a series of "wholly unfounded" policy decisions from our high universities are presently concerned with their own problems and the state of morale in higher education generally is hardly conducive to bold and imaginative forward thinking. But that could be the subject of another article.

Bill Kirkman

The author is director of the University Careers Service at Cambridge.

Don's diary

Monday

I hope the kettle will behave itself. This morning I am teaching on our "Indian" course. This is a specially designed 12-week management course for Indian Headmasters with a follow up visit to the Himalayas planned for next summer. There seems a good chance of me going. For some reason I feel better about it than any of our other courses. Although they do have some overseas attractions, I arrive just before 9.30 with briefcase in one hand and large old fashioned jug-type of kettle in the other. I had never seen a kettle like this one before last Saturday. The course members seem pleased at the sight of the kettle. Previously we had had to walk some distance through the cold English air to get a hot drink. After the first couple of times I've found that most of them preferred to go without a drink rather than face the walk outside. After failing to negotiate the loan of either the other two kettles in the building I had decided to get one of our own. Luckily last week a request from the local scout troop gave me an idea. So on Saturday afternoon I had joined the queue of people who were armed with plastic bags and I had not been to a jumble sale for years.

At last the experience of playing rugby at school came in useful and I obtained the kettle for 15 pence. I arrive home in the evening and find that the MSc course tutor has been trying to contact me about doing some extra sessions for his course. Being a good Toolest I decide on a course of non-action. I phone the colleague who is lecturing on the Indian course tomorrow, explain about the kettle and ask him to bring some tea-bags.

Tuesday

Tuesday is team-building day. A colleague and I are engaged in a real life team building situation. We have been struggling for several months to build this group into a team. It's certainly helped to build us into a team, however we have doubts as to our success with them. We set off at about 8.15 not having yet decided what we are doing today. The pressure of work has got in the way of our planning. Luckily we have an hour's drive ahead of us and during that time we intend to work out a design for the day. The day starts with a bang. We have gone only two miles when a car hits us on the side. Fortunately for me, my colleague was driving his car. He is a bit shocked so we limp back to my house, leave his car there and we come up with some excellent ideas for the day and the team building session goes so well that we decide that we will write up our approach to team building for a presentation to the group when we get the time. Perhaps on a longer car journey. In the evening I call in at the hotel where the Indians are staying, and confirm that they can coo round on Sunday.

Wednesday

The morning session on network analysis turns out to be about operations research in a housing project. Fortunately I have done a network analysis on making the tea and that part of the morning goes as planned. I spend the afternoon in tutorials, struggling with the plausible front, preparing my case for not doing the extra lectures on the MSc course and trying to sort out what has happened to my missing expense claim. The evening is taken up by a meeting of the Regional Organization Development Network. As my wife is also interested in this we run up further debt in terms of another air for the baby-sitting circle.

Thursday

In the morning I lecture to the part-time diploma course about the effective manager. In the afternoon, I fix up some

visits for the Indian course, carry out some tutorials and make further enquiries about the missing expenses. The problem seems to be that I have claimed car travel from home instead of from the polytechnic. That some of the trips were on Saturdays and Sundays, when I would not have gone into the polytechnic, seems beside the point. The rule does not take account of this. It also does not take account of the fact that I don't normally travel in by car unless I need it for polytechnic business.

Friday

Deepavali greetings. This is the legend on the cards which are presented to us. It seems that next Tuesday is Deepavali, a Hindu festival of light and illumination. Wonder if I can arrange a trip to Blackpool for them for that day. If not the course will have to provide them with the light and illumination.

In the evening two of the Indians call round to check what spices we have got. They are impressed by our range of mortars. I hope that on Sunday we will learn how to use them properly. I wonder if we would have been wiser to offer them a traditional English meal?

Saturday

At last a break from teaching. Manage to get some Assam tea, colleague calls round with some lamb for one of tomorrow's curries. Forget about getting Indian records from the library until it is closed. However, manage to borrow a couple of suitable records from friends. Run up a further baby-sitting debit in the evening by going to a colleague's for dinner. Hope my meal tomorrow will go as smoothly as this one. Have nightmare about being thrown into debtors prison by the baby-sitting circle. Decide to borrow dream interpretation book from library.

Sunday

In the morning run a session on communications for the Adult Education Teachers' Course. Nearly decided to refuse to do it as it is on the wrong side of the city and I will not be able to claim my expense in full. But as the course tutor is a friend I decide I cannot let him down. At four o'clock I go to the hotel and collect the three course members who are going to do the cooking. I had not realized the problem of cooking a meal for 16 people, particularly using three Indian cooks and catering for both vegetarians and non-vegetarians. I am used to running group exercises, but not like this. The cooks get to work.

Fortunately we have an old table in the garden. Out he goes to prepare the lamb curry. I suddenly remember the camping stove and climb up into the loft to look for it. I eventually find it and set it up outside. He is certainly coping well with adverse conditions. Luckily the rain is not too heavy. The others arrive and we try to find enough suitable drinks for everyone. The cook wearing the short notices our apple tree containing apples. If I get 16 and peel them he will prepare something from them. Eventually, after about three hours, all is ready and 15 of us sit down to a delicious meal to the strains of a star in the background. But where is the other Indian? He is still cooking in the kitchen? We track him down. There he sits, cross-legged in his dhuti, in the middle of the kitchen floor, eating his meal. It is a very enjoyable evening and seems to be appreciated by all, even those of us who are exhausted. I say loudly to the other two course tutors how much we are looking forward to the Indian evenings at their houses. They seem very quiet and say nothing.

Graham Williams

The author is senior lecturer in management at Sheffield Polytechnic.

